



University of Toronto

P78-0505.112
U18.1

COMPUTER SCIENCE

NEWSLETTER

No. 100

Edited by C. Alan Ford

Date May 31, 1973

GENERAL NEWS

PAGE

Possible Joint Computer Centre	
Discussed by Computer Users Committee	1
Changes at Scarborough and Erindale	2
Computer Science and Statistics: Seventh Annual	
Symposium on the Interface	3
Personnel Changes	3
Keypunching	4

SYSTEM/370 SERVICES

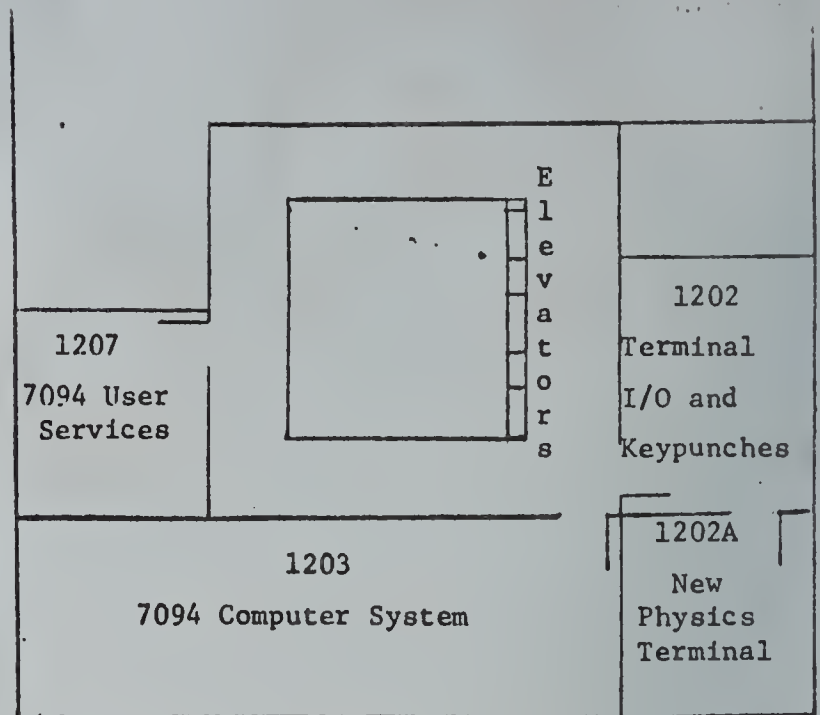
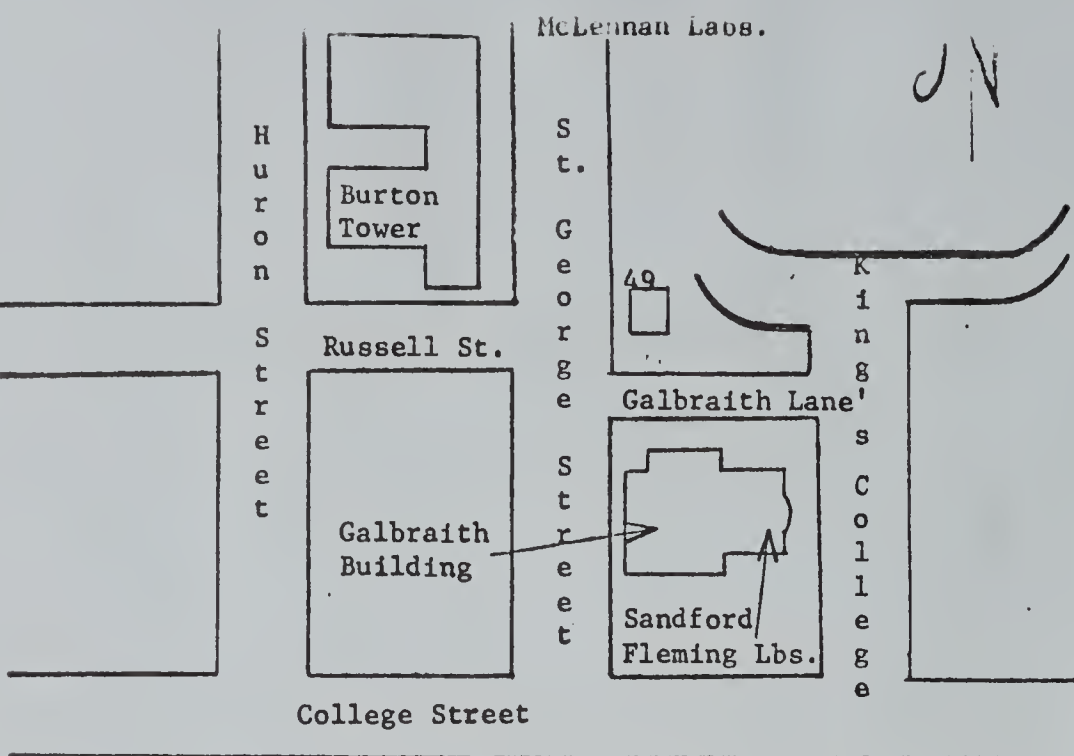
S/370 Memory...It's Not Core Anymore!	5
System/370 Performance Rises to Occasions	5
New COBOL 3.1 ANSI Compiler	7
CRJE Services	8
Credit Requests	9
Message Centre	9
WATLIB	10
Updates Issued for USERBOOK Section 3	11

INTERACTIVE TERMINAL SYSTEMS

Interactive Systems Reliability	13
I. P. Sharp Newsletter	14

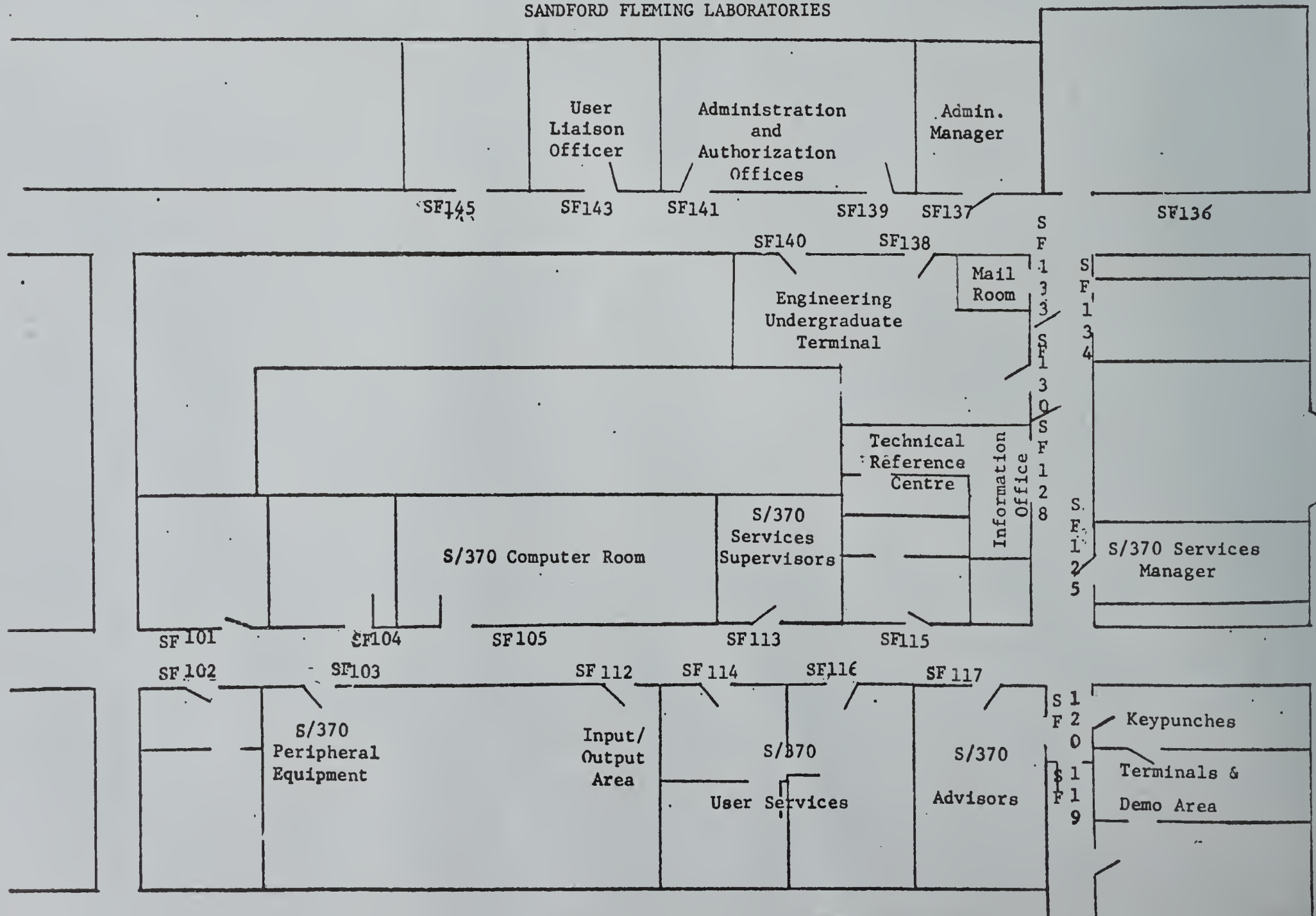
COMPUTER RESEARCH FACILITY

General News	15
Automatic Indexing at CRF: ULTRADEX	16



FLOOR PLAN: 12th Floor Burton Tower

FLOOR PLAN: UNIVERSITY OF TORONTO COMPUTER CENTRE
SANDFORD FLEMING LABORATORIES



POSSIBLE JOINT COMPUTER CENTRE
DISCUSSED BY COMPUTER USERS COMMITTEE

C. A. Ford

On May 14, 1973 the Computer Users Committee convened for the first time in over a year. Professor R. A. Collins, Civil Engineering, chaired the meeting. The principal agenda item was the consideration of the creation of a joint computer centre by the University of Toronto, York University and Ryerson Polytechnical Institute. This proposition was described in Newsletter No. 99.

Professor Collins gave a synopsis of committee considerations of the idea to date, covering the April 12th approval in principle by the Presidential Advisory Committee on Computer Planning. The concept since has been reviewed by the University of Toronto Governing Council's Committee on Planning and Resources.

At Professor Collins' request Dr. Wilson described events leading to the present proposal, ranging from the 1968 proposal for regional centres through the METANET idea recently considered here at an open forum. METANET has met with a noted lack of enthusiasm but in its place has risen indications of possible increases in inter-institutional cooperation. This plus recent financial pressures led York and Ryerson to undertake active studies including possible exchanges of resources with each other or with Toronto. From this grew the idea for a single larger and more powerful centre to serve all three. The major question had now become whether Toronto is really interested, hence the Newsletter article and the present discussion.

The meeting continued in the form of a general discussion, well-controlled from the chair. The real status of the subject with the several authorities was questioned. Possible benefits and difficulties were postulated and discussed. The implications for the Computer Research Facility, the 7094 and other campus computer operations were addressed. The prospects of providing improved facilities for scientific computing and for time-sharing were explored.

Dr. Wilson pointed out that, since the scheme for a joint centre was neither deeply planned nor committed to as yet, many questions, especially of cost-effectiveness, were unanswerable at present. Neither was it too late to drop the whole idea.

Professor Collins summarized the projected advantages and disadvantages. Another meeting will be convened in mid-June in order to discuss the pros and cons, to consider further developments, and to conduct general Committee business.

Please address requests for further information on C.U.C. business to Professor Collins, Department of Civil Engineering. Your further thoughts on the prospective joint centre are solicited by the C.U.C., by the Computer Centre directorate and by the Policy Committee, Professor M. J. Dignam, chairman.

CHANGES AT SCARBOROUGH AND ERINDALE

R. Cox

UTCC has accepted invitations from Principal Campbell of Scarborough College and Dean Robinson of Erindale College to assume responsibility for operational and user services support at the Scarborough and Erindale terminals for a one year experimental period.

Operational functions at the Colleges will remain essentially unchanged; Muriel Ellis and Beth Dunstall will continue as operators at Erindale and Scarborough respectively. The terminal supervisors at Scarborough and Erindale, Bob Cook and Dave Crouse, will be vacating their present positions to form an administrative computing group responsible for several of the data processing functions at Scarborough and Erindale. Joining them will be Doug Prout and Ford Clancy of Erindale College and Brian Oliver of Scarborough College.

S/370 User Services will expand by two people and will place a representative at each terminal in the very near future. These two people will report to the S/370 Users Services Supervisor, Stan Yagi. The two terminal operators have already commenced reporting to the S/370 I/O Supervisor.

COMPUTER SCIENCE AND STATISTICS: SEVENTH ANNUAL
SYMPOSIUM ON THE INTERFACE

Computer Science and Statistics: Seventh Annual Symposium on the Interface will be held in the Iowa State University Memorial Union on October 18 and 19, 1973, hosted jointly by the Statistical Laboratory and the Department of Computer Science, Iowa State University.

This symposium series is designed for persons interested in the interrelationship between Computer Science and Statistics. Its purposes are to facilitate the design and improvement of computing systems and software by the use of statistics, and enhance the combined uses of statistics and computation as adjuncts to the basic and applied sciences.

Persons who wish to present a contributed paper under several workshop topics, or receive additional information about the symposium, should contact the symposium chairman - William J. Kennedy, Statistical Laboratory, Iowa State University, Ames Iowa 50010. Proceedings will be published.

PERSONNEL CHANGES

P. Kellett

We have lost the services of two Computer Centre staff members this month. Lynn Thomson has left the Accounting Group and Bill Redmond has left S/370 Services.

Karin Walmark has become a full-time member in the Liaison Office as a programmer. She has been working there part-time since December. Susan Wenger has replaced Paula LoBello as the secretary in the Liaison Office and Terry Wood is the new programmer in S/370 Services. We hope you will enjoy working with us.

KEYPUNCHING

(Advt.)

We do it for you

- reasonable rates
- service with a smile

CALL JOHN or JENNIE - ZOOLOGY - 928-5303 Room 601

S/370 MEMORY...IT'S NOT CORE ANYMORE!

R. Cavanagh

Since April 29 the use of the term "Core" has been obsolete on S/370. At approximately 10:30 p.m. on that date the installation of two megabytes of MOS (Metal-Oxide-Silicon) memory was completed. This memory system was produced by Advanced Memory Systems and marketed and serviced by ITEL Canada Limited. To our knowledge this is the first total core replacement with MOS memory on an S/370-165 anywhere.

An intensive investigation of all viable memory products preceded the decision to select ITEL/AMS. We have not yet regretted this decision in any way; the installation was competently handled and service has been excellent. No unscheduled downtime has been caused by memory failure. This is not to say that component failures haven't occurred. It is the nature of MOS memory that an initial burn-in period is required to isolate weak components. However, these failures usually take the form of single bit errors per double word and are automatically corrected.

So remember - it's not core anymore! Perhaps our accounting pages will someday recognize the fact.

SYSTEM/370 PERFORMANCE RISES TO OCCASIONS

C. A. Ford

The Computer Centre has been monitoring the S/370-165 by a number of techniques. Some of these, TORMON for example, are used directly for finding system bottlenecks and, when changes are made, to check the validity of the change.

Another technique views system performance more broadly: it tells not what the system can do or does by the moment but rather how it handles whatever load is put upon it hour after hour, day after day.

This technique of system monitoring has told us that General Purpose prime shift work has utilized 21.2 minutes of billable cpu time per hour, averaged from November, 1972 through April, 1973. More recently, given better tape and disk drives and with the system still better tuned, this figure has peaked at 24.6 cpu minutes per hour averaged over the whole sixty hours of the 9 a.m./9 p.m. prime shift. At the same time the High Speed stream had been using as much as six minutes per hour (measured by TORMON). TORMON has indicated that OS and HASP system tasks performed in supervisor state in support of this workload use half again as much cpu time. Thus the total cpu utilization rate in prime shift has run at about 42 minutes per hour in March, with a peak day at 54 minutes per hour.

The index of General Purpose jobs per hour for the whole prime shift has averaged 132, peaking at 167. But when heavily backlogged for busy periods within prime shift this index has reached 191 jobs per hour. This load-carrying capacity is, however, dependent upon the load confronting the system. During the periods of peak job throughput rate the jobs processed are quite short, in the order of seven seconds each. More recently the jobs have averaged twelve seconds of cpu time, with a much lower job processing rate.

Then, on Monday, April 30, rising to two occasions, the users supplied a rather modest load of much longer-running jobs. The occasions: a Sunday out of service for a hardware change (ITEL memory installed) and a Monday which was the end of a fiscal year. The result: the April 30 prime shift showed 34.1 billable minutes of GPJS cpu time per hour, with a peak of 37.5 minutes per hour over the busiest six hours. The average job, prime shift, used sixteen seconds of cpu time, 66% more than the November/April average.

Exhausted and (we hope) gratified, the users dropped back on the very next day to jobs of under twelve seconds of cpu, and far fewer of them. And so began the familiar exam-time slump.

What remains fascinating is the ability of our S/370-165, as presently tuned, to absorb with ease the more sizeable jobs. At almost the same job throughput rate, the cpu used per hour on April 30 exceeded that of the previous week by 45%. So bring on your number-crunching, fellows!

NEW COBOL 3.1 ANSI COMPILER

H. Kugel

On or about the 1st of July UTCC will replace the current ANSI COBOL compiler with the upgraded Version 3.1.

The default options generated for Version 3.1 will show two differences from those of the current version:

1. the number of lines, LINECNT, to be printed on each page of the COBOL source listing is raised from 57 to 60 to save a bit of paper and time;
2. the NOSTATE default condition has been changed to STATE. This is done as a debugging aid. Now in the case of an ABEND the number of the statement and the verb being executed at the time of the abend will be printed and available for the user.

These changes are the result of discussions at a UTCC/COBOL Users meeting.

Note that the switch from NOSTATE to STATE will produce a compiled module which is larger and not quite so fast as it would be under NOSTATE. This is because many diagnostic routines are generated this default option. Therefore when the user has debugged a program to production status he should recompile it to remove the extra code. This is very easy to do:

```
// EXEC COBLEGO,PARM.COB='NOSTATE'  
//COB.SYSIN DD *
```

```
—  
—  
—
```

With this package, documentation of the new compiler diagnostics is obtained by running a job against the processor. The documentation is not distributed in a manual. To obtain the new documentation just do this:

```
// EXEC COBDOC
```

Note also that in the GO step of all COBOL run procedures a statement

```
//SYSDBOUT DD SYSOUT=A
```

is added for the output from the STATE debug routines.

The Release 3.0 compiler will be kept online as a backup for any problems until further notice. If you have any questions, please call Herb Kugel at 928-7286.

CRJE SERVICES

J. Boddy

CRJE, which was introduced as a replacement system for CPS/RJE, has been available since March 1, 1972. During that time CRJE has provided reliable and adequate service and the number of authorized accounts now stands at 250. The number of jobs submitted via CRJE varies between 10% - 30% of all HASP jobs. The number of users concurrently signed on reaches into the 20's and the connect time regularly shows 7000 plus minutes per day.

The Computer Centre has, however, been aware for some time of some limitations in CRJE. For example, there is support only for basic editing functions and future IBM enhancements will be available only for OS-VS. Consequently the Computer Centre has been actively engaged for some months in evaluation and planning for other terminal systems. To this end the Computer Centre will be taking advantage of the relatively light system load during the summer months to evaluate these alternative systems.

Any CRJE user who is interested in helping evaluate the possible alternatives or who wishes to discuss our plans may call John Wettlaufer at 928-6355.

CREDIT REQUESTS

S. Yagi

March was an excellent month for credit requests, but April credit requests returned to the levels of past months. However, our total job load increased for March and April as expected.

The table below gives a breakdown of credits granted for the month of March and April.

	<u>March</u>	<u>April</u>
Hardware	5	11
Software	15	28
Human	12	18
Total	32	57
# of jobs	55,761	44,375
% of jobs	0.06	0.13

MESSAGE CENTRE

S. Yagi

A Message Centre facility has been established to enable messages to be posted in the I/O room (SF112).

Users may have messages left at 928-5539 between the hours of 9 a.m. and 5 p.m. Monday thru Friday.

System/370 Services hope that this service will provide a communications vehicle for users when working at the Centre. Please do not expect personnel of the Centre to "chase down" people. The Centre will only take messages and post them in the I/O room.

If this service is successful, S/370 Services will study the feasibility of implementing a similar service at appropriate remote terminal locations.

WATLIB

M. Tapia

WATLIB is a collection of subroutines which can be accessed from WATFIV on the HSJS. LISTINGS of routines called can be obtained by coding Y on the LIBLIST field of the WATFIV \$JOB card. Writeups of all routines are available at all High Speed Job Stream terminals.

Several of the Argonne Eispac routines have been added to the WATFIV subroutine library, WATLIB. These routines allow the user to calculate the eigenvalues and eigenvectors for real symmetric, generalized real valued, and generalized complex valued matrices. To produce only eigenvalues add V to the end of the corresponding name below; to receive both eigenvalues and eigenvectors add VV:

SYMR -- for real symmetric matrices
GENR -- for generalized real matrices
GENC -- for generalized complex matrices

Thus to produce eigenvalues and eigenvectors for a generalized real matrix call GENRVV. A writeup describing each of the six subroutines is available from the Information Office. The programs, however, are self documented using the new standards which will be applied to all future additions to WATLIB.

The following routines now exist in WATLIB for solving problems in Civil Engineering:

FRAME and TRUSS ANALYSIS PROGRAMMES

FR2C: for plane frames

FR2EJ: for space truss with load on joints using matrix stiffness method

ZZFR2F: for structures in 3-D space

TRIREC: for constant strain triangles, plane stress rectangle truss elements, isotropic and or the tropic materials using finite element method

LIQUID FLOW ANALYSIS

HZONEC: pressurized water pipeline network

To obtain a current index of the WATLIB package, through the HSJS, type Y on the LIBLIST field of the WATFIV \$JOB card and code the following cards:

ccl cc7

CALL WATLIB;STOP;END

\$DATA

If you have a subroutine which you wish to add to WATLIB, the routine can be added if it meets the documentation standards, has been tested by the author under a wide variety of cases, and if the author is willing to maintain it. UTCC will make the space available for the routine, add it to the library and update it quickly (usually within 1 working day): when requested a backup will be provided. For further details, contact Mark Tapia at 928-7109.

UPDATES ISSUED FOR USERBOOK SECTION 3

J. Campbell

Pages added, and/or replaced by updates:

April 12/73: 3.1 3.1030-3 3.1045-2*
3.1000 3.1030-4
3.1020 3.1040
3.1030 3.1040-2
3.1030-2 3.1045*

April 19/73: 3.2 3.9903-16*
3.2140
3.2144
3.2146*
3.2190*

May 7/73: 3.2000 3.3223
3.2020 3.3225
3.3-1 3.3226*
3.3035 3.3226-2*
3.3050* 3.3240
3.3050-2* 3.3240-2
3.3105 3.3245
3.3110-3 3.3250
3.3200 3.3250-2*
3.3220 3.3250-3*

*new page

Summary of Changes

USERBOOK 3.1 has been updated to reflect changes in the hardware configuration.

The rooms in the Sandford Fleming Building have been renumbered. A translation table (3.1045) summarizes the old and new numbers for most S/370 offices and computer work areas.

New procedures for special printer setup jobs are outlined in 3.2140 through 3.2146.

EXECUTOR is being implemented. This is expected to improve overall system efficiency through expediting many 'CLASS=A' jobs.

INTERACTIVE SYSTEMS RELIABILITY

S. Goldfarb

The uptimes achieved in April for each of APL, ATS, and CPS were 99.45%, 99.25% and 99.25%, respectively. The total number of scheduled hours of operation during the period April 1 through April 30 was 462. In addition to the scheduled hours of operation, APL, ATS and CPS were available during approximately 117 hours of unscheduled weekend time.

The following table summarizes the time lost out of scheduled hours of production. There were late starts due to hardware problems; the time lost was 12, 26 and 23 minutes for APL, ATS and CPS, respectively. The table shows the time lost due to system failures for each of the systems: eleven unscheduled IPL's were required as a result of the failures.

DATE	DOWNTIME (mins)			REASON
	APL	ATS	CPS	
Thu Apr 5	20 12	12 16	13 17	*Hardware *IOS2 Failure (Hardware)
Mon Apr 9	18	19	20	*Disk Error (Hardware)
Wed Apr 18	14 11 12	18 15 16	19 16 15	*Channel Errors (Hardware) *Channel Errors (Hardware) *Channel Errors (Hardware)
Thu Apr 19	17 10	25 15	20 16	*Channel Errors (Hardware) *Channel Errors (Hardware)
Sat Apr 21	11	15	16	*Machine Check (Hardware)
Mon Apr 23	14	20	18	*Undetermined
Fri Apr 27	11	14	15	*Disk Error (Hardware)
Total	140	181	185	*IPL Required

System Failures April 1 to April 30, 1973

I.P. SHARP NEWSLETTER

S. Goldfarb

I.P. Sharp Associates Limited publish a Newsletter to keep their users abreast with the continuing developments and features of APL PLUS. The first issue of the Newsletter (April 1973) contains comments on new commands, the data bank services and the Public Library on the I.P. Sharp system.

Although some of the facilities which will be described in the Newsletters may differ (or may not be available) on the University of Toronto system, the information presented may still be of interest to UTCC's APL community. A copy of the Newsletter will be retained in the Technical Reference Centre, 10 King's College Road, Room 128.

GENERAL NEWS

K. C. Patnaik

CRF Users' Meeting

The monthly Users' meeting was held in Room 222, Sandford Fleming Laboratories at 3:00 p.m. on Friday, April 27, 1973.

Discussion at the meeting centered around the new PDP 11/05 software and other user queries.

The next CRF Users' meeting will be held in Room 222, Sandford Fleming Laboratories at 3:00 p.m. on Friday May 25, 1973. All CRF users are invited to attend.

The CRF/UTCC Merger

The proposed CRF/UTCC merger was discussed at the meeting of the Presidential Advisory Committee on Computer Policy and Planning (PACCPP) on April 12, 1973. The merger proposal was unanimously approved in principle.

The final proposal now requires the approval of the CRF and UTCC Policy Committees.

Staff Changes

John Morton, previously on our part-time operations staff, has been appointed on a full time basis for this summer as an operator/programmer.

Bill Madryga, has joined the CRF software group as a full time programmer for this summer.

High School Students Tour

Approximately 250 applicants to the Faculty of Applied Science and Engineering visited the CRF laboratory as a part of their tour of the University of Toronto. Special demonstrations at CRF and informal talks were provided to Electrical Engineering and Engineering Physics students during their visit.

Visitors to the CRF Laboratory

The following is a partial list of visitors to the CRF laboratory between April 10, 1973 and May 10, 1973. A detailed list of all visitors to CRF is maintained in the CRF laboratory.

Prof. N.J. Claus (Electrical Engineering, University of Maryland, U.S.A.), Prof. G.I. Petrenko, Pro-Rector, (Kiev Polytechnical Institute, U.S.S.R.), Prof. M.A. El-Aaid and Prof. Faud S. Atiya (Cairo University, Egypt) Prof. M. Bialk (Technical University of GDANSK, Poland), Dr. A.C. Davies (Electrical Engineering Department, City University, London, England), Dr. R.W. Donaldson (Electrical Engineering Department, University of British Columbia), Prof. G.S. Deutsch (DCS, University of Maryland, U.S.A.).

AUTOMATIC INDEXING AT CRF: ULTRADEX

In keeping with CRF's principal objective, which is the use of computer technology to further scientific research, we are currently in the final stages of implementing ULTRADEX, a sophisticated automatic indexing program.

The chief purpose of ULTRADEX is to enable research workers who have extensive files of research papers to retrieve information quickly and efficiently.

ULTRADEX has extensive indexing and search capabilities. It will produce bibliographic indexes, KWIC (Keyword in Context) indexes, KWOC (Keyword out of Context) indexes, indexes of accessions, indexes of associated descriptors, etc., at the option of the user. It will conduct searches of titles, authors, sources, abstracts, etc., in response to user requests.

The ULTRADEX system was developed by Malcolm Hindley-Smith, CRF's new Research Coordinator, whose previous experience includes several years as a consultant in the field of information management systems. The system takes advantage of recent developments in data-processing technology, and is implemented principally in SPITBOL.

If you are having a problem with your Xerox reprint file, or are intrigued by the idea of automatic indexing, Malcolm would be delighted to hear from you at 928-8992.

UTCC DIRECTORYROOM
PHONE
928-UTCC COMPUTER EQUIPMENTDIRECTOR

John C. Wilson 49 St.Geo 6496

ASSISTANT DIRECTOR

C. Alan Ford 49 St.Geo 2991

USER LIAISON OFFICERBill Greene SF143 2694
Information Office SF128 4990 or 4991ADMINISTRATION MANAGER

Jerry Palter SF137 8948

AUTHORIZATION CLERKSNancy Pocock SF139 8702
(S/370 + 7094)Yvonne Davis 49 St.Geo 8703
(Interactive)S/370 SERVICESMANAGER

Dave McNaughton SF125 6281

INPUT/OUTPUT SUPERVISOR

Derry Cox SF113 7092

USER SERVICES SUPERVISOR

Stan Yagi SF113 7331

SYSTEMS SUPPORT SUPERVISOR

Rein Mikkor SF113 5058

PROGRAM ADVISORS SF117 8599

INTERACTIVE TERMINAL SYSTEMSMANAGER

Sam Goldfarb 49 St.Geo 3787

7094 SERVICESMANAGER

Joyce Walton BT1207 7094

(a)

SYSTEM/370 MODEL 165

- located in SF 112
- provides General Purpose Job Stream, High Speed Job Stream and Conversational Remote Job Entry services
- 2048K bytes of core
- 1 drum
- 4 disk drives IBM (3330)
- 8 disk drives IBM (2314)
- 6 magnetic tape drives (4 9-track and 2 7-track)
- 6 display consoles
- 6 printers
- 5 card readers
- 1 card punch
- 7 remote batch terminals
- 1 paper tape reader
- CALCOMP plotter (11" and 30")
- OS/MVT with HASP

(b)

SYSTEM/360 MODEL 65

- located in Room 333 McLennan Physical Laboratories
- provides Interactive Systems Service
- 1536K bytes of core
- 16 disk drives (2314)
- 2 9-track magnetic tape drives
- 1 printer
- 1 card reader
- 1 card punch
- 120 typewriter terminals
- OS/MVT with APL, ATS, and CPS

(c)

7094 II

- located in Room 1203 Burton Tower
- 32K words of core
- 1 disk
- 8 magnetic tape drives
- input/output via a 1401 computer

JOB STATUS QUERIES:

SYSTEM/370 7373

7094 7094

INTERACTIVE TERMINAL SYSTEMS:System Status 6234
APL 7200
ATS 7100
CPS 6200CONVERSATIONAL REMOTE JOB ENTRY (CRJE)Tel: 7223 7381 7386
TTY: 7445

UNIVERSITY OF TORONTO
COMPUTER CENTRE
TORONTO, CANADA

SERIALS DEPT.,
UNIVERSITY OF TORONTO LIBRARY
UNIVERSITY OF TORONTO.